

We Claim:

1. A method of providing hot back-up for a satellite communication satellite system comprising

collocating two satellites; and

utilizing a complementary channel arrangement for the two satellites which facilitates full dual pole coverage continuity when one of the satellites fails.

2. A system comprising:

a first satellite configured to include multi-spot beams having a first channel arrangement;

a second satellite, co-located with the first satellite, having a second channel arrangement complementary with the first channel arrangement.

3. A method of operating a two-way communication satellite communicating comprising:

receiving Ka band frequency channels from Hub and converting the Ka band frequency channels to Ku band frequency channels for down-link directed messages to a plurality of user terminals;

receiving Ku band frequency channels from a plurality of user terminals and converting the Ku band frequency channels into Ka band frequency channels and outputting the Ka band channels to the Hub.

4. An apparatus comprising:

a communication satellite comprising a first interface configured to communicate using Ka frequency band channels and a second interface configured to communicate using Ku frequency band channels;

a gateways configured to send and receive data to the communications satellite using the Ka frequency band channels; and

a plurality of user terminals configured to send and receive data to the communications satellite using Ku frequency band channels.

5. A method of operating a network operations center to control a satellite to receive Ka band frequency channels from a Hub and convert the Ka band frequency channels to Ku band frequency channels for down-link directed messages to a plurality of user terminals, and to receive Ku band frequency channels from a plurality of user terminals and to convert the Ku band frequency channels into Ka band frequency channels and output the Ka band channels to the Hub.

~~6.~~ A multi-mode communication satellite comprising a two antenna system and a switch configured to switch a plurality of transponders between a spot beam mode and a generic beam mode.

7. The multi-mode communication satellite of claim 4 wherein the switch is configured to switch all of the transponders or a portion of the transponders.

~~8.~~ A satellite comprising:

a first antenna system having multiple spot beams;

a satellite control configured to control the first antenna system to switch transponders from one spot beam to another responsive to control channels.